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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/524,455	02/10/2005	Eberhard Perplies	2002DE430	8656
7590 05/20/2010				
Klaus Schweitzer ProPat 425 C South Sharon Amity Road Charlotte, NC 28211			EXAMINER BLAND, LAYLA D	
			ART UNIT 1623	PAPER NUMBER
			MAIL DATE 05/20/2010	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/524,455

**Applicant(s)**

PERPLIES ET AL.

**Examiner**

LAYLA BLAND

**Art Unit**

1623

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 March 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,4,7-9,11 and 14-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,4,7-9,11,14-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S508)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

This office action is in response to Applicant's amendment submitted March 11, 2010, wherein claims 1, 14, and 15 are amended and claim 16 is newly submitted.

Claims 1, 4, 7-9, 11, and 14-16 are pending and are examined on the merits herein.

The following new rejections were necessitated by Applicant's amendment submitted March 11, 2010, wherein "consisting of cellulose ether and chemical compounds containing at least one aldehyde group and at least one acid group" was added to claims 14 and 15.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 14 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 14 and 15 are amended to recite the limitation "consisting of cellulose ether and chemical compounds containing at least one aldehyde group and at least one acid group." The meaning of this limitation is unclear. A cross-linked product would not

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contain a chemical compound containing at least one aldehyde group and at least one acid group, because the acid and aldehyde groups must react to form ester and hemiacetal bonds, in order to obtain the crosslinked product. The limitation appears to require an unreacted mixture, but since the claims are drawn to a preparation of a crosslinked product, there is a contradiction. If this amendment is intended to exclude some other compound, linkage, or functional group by the use of "consisting of," it is unclear what the excluded element is. The specification does not mention a "consisting of" product or give any guidance as to particular elements which should be excluded.

Claims 14 and 15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 14 and 15 are amended to recite the limitation "consisting of cellulose ether and chemical compounds containing at least one aldehyde group and at least one acid group." The examiner was unable to find literal support for this limitation in the specification, and Applicant did not point where literal, inherent, or implicit support could be found. The limitation is vague and indefinite, as set forth above, but can be interpreted to encompass subject matter which was not described in the specification. As set forth above, the limitation appears to encompass an unreacted mixture, or a crosslinked product which has released the crosslinking agent. However, the specification (page 4) explicitly states that during dissolution of

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crosslinked product, the ester bond will remain intact and the crosslinking agent will not be eliminated from the crosslinked cellulose ethers. Thus, the specification does not provide support for a crosslinked product which has released the low molecular weight compound. This is a new matter rejection.

The following rejection is maintained and modified to include new claim 16:

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 4, 7-9, 11, and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Menkart et al. (US 3,072,635, January 8, 1963, of record) in view of

Jullander (US 2,879,268, March 24, 1959, of record) and Block (US 4,366,070, December 28, 1982, of record).

Menkart teaches a method for producing cellulose derivatives with improved water solubility, comprising treating a cellulose ether with glyoxal [column 1, lines 37-49]. Cellulose ethers such as methyl hydroxyethyl cellulose, ethyl hydroxyethyl cellulose, and others may be used [column 2, lines 10-30]. The cellulose ether should have at least 10% moisture [column 3, lines 4-11]. The glyoxal can be dissolved in a solvent such as acetone, methanol, or water, the cellulose derivative suspended therein with agitation for less than 30 minutes, followed by separation of the liquid to give a solid containing about 20 to 80 percent of an adsorbed solution, followed by oven drying about 100°C, during which the reaction takes place [column 3, lines 14-47]. Another method involves spraying the crosslinking agent onto a mass of particles of moist carboxymethylcellulose which is being subjected to a mixing action [column 3, lines 49-55]. In one example, the reaction takes place over about 30 minutes [column 5, Example 1]. Glyoxal can be used in an amount of 0.001 to 0.2 moles per mole of cellulose derivative [claim 1] or about 0.02-0.5 weight percent [column 5, line 32]. The products of this method disperse in cold water without forming lumps and dissolve within 15 to 20 minutes [column 3, lines 43-48]. In one example, the product was pulverized after drying [column 6, Example 4].

Menkart does not teach pulverization or milling before drying, and does not teach the use of glyoxylic acid as the crosslinking agent.

Jullander teaches a process for improving the dissolution of high molecular weight substances in water [column 1, lines 12-23]. Hydroxyethyl cellulose was suspended in water to give a mass of 50% solids. Glyoxal was added to the mass, which was then subjected to repeated extrusions. The product was ground in a mill and then dried at 60°C for two hours. The product did not agglomerate in water [column 8, Example 15]. Other solvents which may be used include acetone, methyl ethyl ketone, methanol, ethanol, and propanol [column 8, lines 45-61]. Other suitable cellulose ethers include methyl cellulose, ethyl cellulose [column 1, lines 67-70] and ethyl hydroxyethyl cellulose [column 3, lines 36-41].

Block teaches a cross-linked hydroxyalkyl cellulose reaction product for use in aqueous systems [see abstract], formed by contacting a hydroxyalkyl cellulose with a cross-linking agent which can be glyoxylic acid or glyoxal [column 5, lines 6-35]. The crosslinked products are used in aqueous systems [column 10, lines 9-12].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to carry out a crosslinking reaction of cellulose ethers with glyoxylic acid, wherein the cellulose ethers are moistened or suspended but not dissolved in water or organic solvent. Both Menkart and Jullander teach cross-linking of cellulose ethers wherein the cellulose ethers are suspended in water or organic solvent, but not dissolved. Menkart teaches that cellulose ethers should be pre-moistened with at least 10% water, and teaches reaction of cellulose ethers containing 20-80% adsorbed solution. Jullander teaches reaction of a mass of 50% solids. Both Menkart and Jullander teach that the processes result in products which disperse in cold water

without forming lumps or without agglomeration. Although Menkart and Jullander teach cross-linking with a dialdehyde such as glyoxal, Block teaches that either glyoxal or glyoxylic acid can be used for crosslinking cellulose ethers. Thus, the skilled artisan could reasonably expect that either glyoxal or glyoxylic acid could be used in Menkart's or Jullander's process. It would also have been obvious to mill or pulverize the product before drying. Menkart teaches pulverization after drying, and Jullander teaches milling before drying. Each process results in a product which does not agglomerate in water, so the skilled artisan would expect that either order of steps could be used.

#### ***Response to Arguments***

Applicant argues that Block, the reference which discloses glyoxylic acid, is drawn to crosslinking hydroxyalkyl cellulose, not alkyl hydroxyalkyl cellulose. Applicant argues that alkyl hydroxyalkyl cellulose is less reactive alkyl hydroxyalkyl cellulose due to having fewer -OH groups, and so the skilled artisan would not have expected success in reacting glyoxylic acid with alkyl hydroxyalkyl cellulose. This argument is not persuasive because, although alkyl hydroxyalkyl cellulose would have fewer -OH groups than hydroxyalkyl cellulose, each has the primary -OH groups from the hydroxyalkyl ether. These primary -OH groups would be more reactive than then secondary or tertiary -OH groups which are "missing" from alkyl hydroxyalkyl cellulose, and they are present in each case. Thus, both alkyl hydroxyalkyl cellulose and hydroxyalkyl cellulose derivatives contain reactive primary -OH groups, so the skilled artisan would expect success in crosslinking these. It is also noted that new claim 16 is not limited to any particular cellulose ethers.



Applicant argues that conventional wisdom suggests the use of a dilute solution for a less reactive starting material, and that the claims require that the cellulose ether is not dissolved. This argument is not persuasive because the prior art very clearly teaches crosslinking methods wherein the cellulose ether is not dissolved, and the art of record does not teach or suggest that less reactive cellulose ethers require a dilute solution. To the contrary, Menkart's process, suitable for use with methyl hydroxyethyl cellulose, etc. can be carried out on a suspension, a solid containing adsorbed solution, or a moistened cellulose, all of which are representative of "admixed but not dissolved."

Applicant argues that Jullander does not teach the comminution step recited in claims 14 and 15. This argument is not persuasive because Jullander teaches extrusion and grinding in a mill. The examiner was unable to locate a definition for "comminuting" in the instant specification, but the definition according to online dictionary is "to reduce to minute particles, or to a fine powder; to pulverize; to triturate; to grind." This would happen both during the high shear conditions used in extrusion and in the milling step.

Applicant argues that Menkart teaches that either dilute or concentrated solutions are effective, and Applicant questions whether "suspended in" means not dissolved. The art recognized definition of a suspension is "the state of a solid when its particles are mixed with, but undissolved in, a fluid, and are capable of separation by straining." Definitions for "comminuting" and "suspension" are attached herein for Applicant's convenience. Although Menkart teaches more than one embodiment, the presence of a dilute embodiment does not teach away from the disclosed concentrated embodiment.

MPEP 2123 states: "A reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill in the art, including nonpreferred embodiments," and "Disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments."

Applicant's arguments with respect to Block are substantially the same as were previously addressed.

Applicant argues that the cited references do not suggest that admixing but not dissolving the cellulose ethers along with compounds having an acid group would result in reversibly crosslinked alkyl cellulose ethers providing lump-free stirrability. This argument is not persuasive because, as set forth above, the cited references do teach processes wherein the cellulose ethers are admixed but not dissolved, and the resulting products disperse in cold water without forming lumps. The skilled artisan is aware of the difference between an acid and an aldehyde and the corresponding ester and hemiacetal bonds, and it is well known that hemiacetal bonds are reversible.

Applicant argues that the claimed process wherein the cellulose ether is not dissolved results in products which do not form lumps when introduced into aqueous solutions. The declaration of Dr. Andreas Schultz compares Applicant's Example 1 with Block's process, and finds that the product produced by Block's process formed lumps upon stirring into aqueous solution. Applicant's argument has been carefully considered but is not persuasive. MPEP 716.02 (c) II states that "Expected beneficial results are evidence of obviousness of a claimed invention, just as unexpected results are evidence of unobviousness thereof." *In re Gershon*, 372 F.2d 535, 538, 152 USPQ 602,

604 (CCPA 1967) (resultant decrease of dental enamel solubility accomplished by adding an acidic buffering agent to a fluoride containing dentifrice was expected based on the teaching of the prior art); *Ex parte Blanc*, 13 USPQ2d 1383 (Bd. Pat. App. & Inter. 1989) (Claims at issue were directed to a process of sterilizing a polyolefinic composition which contains an antioxidant with high-energy radiation. Although evidence was presented in appellant's specification showing that particular antioxidants are effective, the Board concluded that these beneficial results would have been expected because one of the references taught a claimed antioxidant is very efficient and provides better results compared with other prior art antioxidants.). In this case, Applicant argues that processes wherein the cellulose ether is not dissolved in solvent results in products which do not form lumps when stirred into aqueous solution. However, both Menkart and Jullander teach processes wherein the cellulose ether is not dissolved, and both Menkart's and Jullander's products do not form lumps in aqueous solution. Thus, Applicant's result is expected. The declaration of Dr. Andreas Schultz shows that products produced by Block's process formed lumps when stirred into water, unlike the products of Example I. However, it is not clear whether the difference was due to the amount of solvent used in the processes. The cellulose ethers used in the two examples are not the same, Example 1 was milled wet while the comparative example was not, and the amount of glyoxylic acid used in the comparative example is about 20 times greater than Example 1. MPEP 716.01(b) states: To be given substantial weight in the determination of obviousness or nonobviousness, evidence of secondary considerations must be relevant to the subject matter as

claimed, and therefore the examiner must determine whether there is a nexus between the merits of the claimed invention and the evidence of secondary considerations.

*Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 305 n.42, 227 USPQ 657, 673-674 n. 42 (Fed. Cir. 1985), *cert. denied*, 475 U.S. 1017 (1986). The term "nexus" designates a factually and legally sufficient connection between the objective evidence of nonobviousness and the claimed invention so that the evidence is of probative value in the determination of nonobviousness. *Demaco Corp. v. F. Von Langsdorff Licensing Ltd.*, 851 F.2d 1387, 7 USPQ2d 1222 (Fed. Cir.), *cert. denied*, 488 U.S. 956 (1988). In this case, it is not clear which experimental parameter is responsible for Applicant's result. Furthermore, it is not clear whether Block is the closest prior art. MPEP 716.02(e) states: An affidavit or declaration under 37 CFR 1.132 must compare the claimed subject matter with the closest prior art to be effective to rebut a *prima facie* case of obviousness. *In re Burckel*, 592 F.2d 1175, 201 USPQ 67 (CCPA 1979). "A comparison of the *claimed* invention with the disclosure of each cited reference to determine the number of claim limitations in common with each reference, bearing in mind the relative importance of particular limitations, will usually yield the closest single prior art reference." *In re Merchant*, 575 F.2d 865, 868, 197 USPQ 785, 787 (CCPA 1978) (emphasis in original). Where the comparison is not identical with the reference disclosure, deviations therefrom should be explained, *In re Finley*, 174 F.2d 130, 81 USPQ 383 (CCPA 1949), and if not explained should be noted and evaluated, and if significant, explanation should be required. *In re Armstrong*, 280 F.2d 132, 126 USPQ 281 (CCPA 1960) (deviations from example were inconsequential). The

examiner understands the important limitations to be the amount of solvent used, reaction stoichiometry, and crosslinking agent. Menkart teaches the claimed limitations of cellulose not being dissolved and the claimed stoichiometry, but not glyoxylic acid. Block teaches the use of glyoxylic acid, but does not teach "not dissolved" or the claimed stoichiometry. Thus, it appears to the examiner that Menkart is closer to the claimed process than Block because it teaches more of the claimed limitations.

### ***Conclusion***

No claims are allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAYLA BLAND whose telephone number is (571)272-9572. The examiner can normally be reached on Monday - Friday, 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anna Jiang can be reached on (571) 272-0627. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Examiner, Art Unit 1623

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